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CLINICAL ADVISORY
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Anthrax and “Flu-like” Illness

Inhalational anthrax is the disease syndrome that results when aerosols of 1-5 micron particles containing spores of *Bacillus anthracis* are inhaled, then are ingested by phagocytic macrophages resident in the alveoli of the lungs and multiply in those cells before, during or after migration from the alveoli to the lymph nodes of the lung and mediastinum. Early antimicrobial treatment of inhalational anthrax is critical. Inhalational anthrax is a rare disease. Untreated, it is usually fatal.

Generally, initial signs and symptoms of inhalational anthrax are said to be “flu-like” in the sense of febrile influenza-like illness (ILI). ILI is characterized by fever, headache, myalgia, coryza, sore throat and cough. In addition to influenza viruses, ILI can be caused by other viruses, such as parainfluenza virus and adenovirus. ILI should be differentiated from the “common cold” upper respiratory tract infection that is usually not associated with fever or prominent systemic signs and symptoms.

Many people with ILI present to health care in the winter. This has raised concern about differentiating cases of ordinary ILI from early anthrax. Indeed, in the present circumstances of anthrax releases and some cases of inhalational anthrax, an elevated index of suspicion needs to be maintained when seeing patients with ILI. It should be kept in mind that most people with ILI will not have a risk for the type of exposure to anthrax spores that is likely to lead to inhalational anthrax and almost certainly have viral disease. It should also be kept in mind that, even when influenza virus is circulating and cases of influenza are occurring in the community, most cases of ILI (~70%) are not associated with isolation of influenza virus and are of other viral etiology.

The following risk groups for exposure to anthrax spores have been identified in the course of recent bioterrorism incidents; however some cases in individuals who are not members of these groups are being investigated:

- postal workers (in particular, those postal workers with exposure to automated sorting machines),
- employees of media corporations,
- political figures and government officials, and their staff,
- persons who have visited locations with known or suspect anthrax contamination, such as mail handling facilities, media companies, places where anthrax spores have been found in the environment or where cases have occurred,
- anyone with a history of contact with a contaminated or potentially contaminated powder that could have presented a credible risk for anthrax spore exposure.

The following points may assist in evaluating patients with ILI for possible anthrax:

- Assess the employment history and exposures that may put an individual at higher risk.
- Chest tightness, early dyspnea, and respiratory tract signs and symptoms associated with nausea, vomiting and abdominal pain are more suggestive of anthrax; while prominence of rhinorrhea

and sneezing are more suggestive of viral illness rather than anthrax. It should be noted that half of the recent inhalational anthrax cases did not have fever initially. In some of these recent cases, there was no report of prodrome of respiratory and systemic flu-like symptoms.

- Patients who have not been treated with antibiotics and present 5-7 days into their illness without progression, and with a course consistent with viral etiology, are unlikely to have anthrax.
- If available, do a rapid test for influenza in order to assist in ruling-in influenza. It is important to counsel patients that there are many viruses that cause acute respiratory illness and that “flu-like” symptoms are most often not associated with positive tests for influenza virus infection; that a negative test for influenza does not imply a diagnosis of anthrax.
- For a member of a higher risk group with nonspecific, febrile respiratory illness:
 - Obtain a complete blood count (looking for leukocytosis with band forms) and a chest x-ray (looking for hilar fullness, mediastinal widening and/or pleural effusions). In some cases of inhalational anthrax, a CT scan of the chest may demonstrate findings in the hilum, mediastinum and pleural cavity that may not be appreciable on a chest x-ray obtained early in the course of disease. In circumstances of a higher degree of suspicion of inhalational anthrax, a CT scan should be considered.
 - Obtain blood cultures prior to antibiotic treatment.
 - Obtain a rapid influenza test and/or nasopharyngeal specimen for viral culture.
 - For those at high risk and ILI, without an established viral etiology, consider a three day course of ciprofloxacin (500 mg, PO, twice daily) or doxycycline (100 mg, PO, twice daily), while awaiting test results and further data.
 - Whether the patient is treated with antibiotics or not, counsel the patient and family to seek medical attention immediately if clinical status worsens.
 - If the patient is treated with an antibiotic and pre-treatment blood cultures are negative, and the patient is stable or improved, then discontinue antibiotics or treat as clinically warranted.
- For patients who are not members of an identified risk group, assess ILI for any suggestion of anthrax (high fever, chest tightness, unusual degree of difficulty breathing, signs of sepsis, prominence of nausea, vomiting and/or abdominal pain associated with respiratory syndrome), but avoid antibiotic treatment for non-specific or viral illness. (see clinical advisory on inhalational anthrax at the website:
http://www.state.ma.us/dph/topics/bioterrorism/ca_inhanthrax.pdf).
- As of November 5, 2001, there have been no cases of anthrax reported in Massachusetts and no positive cultures from environmental sources or suspect material. If this changes, if new information develops from elsewhere, or if cases of anthrax occur outside of high risk groups, then these recommendations may be modified.

The occurrence of influenza-like illness can be reduced, but not eliminated, by immunization against influenza. Delayed shipments of influenza vaccine are now arriving. Priority for influenza immunization must be given to those at highest risk of severe influenza or its complications. Please refer to the information on the MDPH website at <http://www.state.ma.us/dph/cdc/epii/flu/FLU1.HTM>. The MDPH does not recommend administration of influenza vaccine as a way of avoiding viral illness that might be mistaken for anthrax. Once people at highest risk of complications of influenza and other priority groups are immunized by mid-December, influenza immunization should be considered by anyone else who would like to reduce their risk of influenza.

For more information, see <http://www.state.ma.us/dph/topics/bioterrorism/BT.htm>, and <http://www.bt.cdc.gov>. The MDPH information line on emergency preparedness and response is **1-866-627-7968**.